IN THE CLAIMS:

1. (Currently Amended) A method ~~for suppression of interfering co-channel signals, synchronous or asynchronous, in a single antenna interference cancellation (SAIC) receiver (10) by calculating a desired impulse response estimate signal ($\hat{\mathbf{h}}_{JCE}^{(1)}$)~~, comprising ~~the steps of~~:

receiving ~~(60)~~ a radio signal ~~(11)~~ by a receiver filter ~~(12)~~ of the ~~SAIC~~ single antenna interference cancellation receiver ~~(10)~~ and providing a filtered waveform signal ~~($\mathbf{y}$)~~ to a joint channel estimator (40) of a joint channel estimator module ~~(24)~~ of the single antenna interference cancellation ~~SAIC~~ receiver ~~(10)~~;

providing ~~(65)~~ a desired bit decision signal ~~($\hat{\mathbf{a}}(1)$)~~ to the joint channel estimator module ~~(24)~~; and

computing ~~(72) the~~ a desired impulse response estimate signal ~~($\hat{\mathbf{h}}_{JCE}^{(1)}$)~~ by the joint channel estimator ~~(40)~~ using the filtered waveform signal ~~($\mathbf{y}$)~~, the desired bit decision signal, ~~($\hat{\mathbf{a}}(1)$)~~ and an interfering training sequence signal ~~(37)~~ and an interfering training sequence delay signal ~~(38)~~ generated without prior knowledge of a training sequence of the interfering co-channel signals for suppression of interfering co-channel signals, synchronous or asynchronous, in a single antenna interference cancellation receiver.

2. (Currently Amended) The method of claim 1, after ~~the step of~~said providing ~~(65)~~ the desired bit decision signal ($\hat{\mathbf{a}}(1)$) to the joint channel estimator module ~~(24)~~, further comprising ~~the steps of~~:

computing ~~(64)~~ a replica signal ~~(32)~~ calculated by a replica signal generation means ~~(30)~~ of the joint channel estimator module ~~(24)~~ as a convolution of the desired bit decision signal ~~$\hat{\mathbf{a}}(1)$~~ and a replica impulse response ~~$\mathbf{h}_r$~~ of said replica signal generation means ~~(30)~~; and

generating ~~(66)~~ a residual signal ~~($\hat{\mathbf{r}}$)~~ by subtracting the replica signal ~~(32)~~ from the filtered waveform signal ~~$\mathbf{y}$~~ using an adder ~~(44)~~.

3. (Currently Amended) The method of claim 2, wherein the interfering training sequence ~~(37)~~ and the interfering training sequence delay signal ~~(38)~~ are identified by calculating correlating signals of said residual signal ~~($\hat{\mathbf{r}}$)~~ with the candidate training sequences or training sequences convolved by a known transmission pulse shape for all possible bit positions; among said correlating signals, the maximum correlation signal is selected as interfering training sequence ~~(37)~~ and the corresponding timing position as the interfering training sequence delay signal ~~(38)~~ which are provided to the joint channel estimator ~~(40)~~.

4. (Original) The method of claim 1, wherein the interfering signals are asynchronous with a desired signal.

5. (Original) The method of claim 1, wherein the interfering signals are synchronous with a desired signal.

6. (Currently Amended) The method of claim 1, wherein the desired bit decision signal ~~($\hat{\mathbf{a}}(l)$) consists~~ partly comprises ~~of~~ a known training bit sequence signal.

7. (Currently Amended) The method of claim 1, after receiving ~~(60)~~ the radio signal by the receiver filter ~~(12)~~, further ~~comprising the steps of~~ comprises:

computing ~~(62)~~ an initial desired impulse response estimate signal ~~($\hat{\mathbf{h}}_{CM}$)~~ using the filtered waveform signal ~~($\mathbf{y}$)~~ by a channel estimator ~~(22)~~ of a first stage ~~(14)~~ of the single antenna interference cancellation ~~SAIC~~ receiver ~~(10~~); and

computing ~~(64)~~ the desired bit decision signal ~~($\hat{\mathbf{a}}(l)$)~~ using the initial desired impulse response estimate signal ~~($\hat{\mathbf{h}}_{CM}$)~~ and the filtered waveform signal ~~($\mathbf{y}$)~~ by a single antenna interference cancellation ~~(SAIC)~~ detector ~~(20)~~ of the first stage ~~(14)~~ of the single antenna interference cancellation ~~SAIC~~ receiver ~~(10)~~.

8. (Currently Amended) The method of claim 7, wherein the channel estimator ~~(22)~~ is an iterative constant modulus ~~(CM~~) channel estimator and single antenna interference cancellation ~~SAIC~~ detector ~~(20)~~ is a constant modulus single antenna interference cancellation ~~(CM SAIC)~~ detector.

9. (Currently Amended) The method of claim 1, after ~~the step of~~ said computing ~~(72)~~ the desired impulse response estimate signal ~~$(\hat{\mathbf{h}}^{(1)}_{JCE})$~~ by the joint channel estimator ~~(24)~~, further comprising ~~the step of~~:

computing ~~(74)~~ a further desired bit decision signal ~~$(\hat{\mathbf{a}}(2))$~~ using the desired impulse response estimate signal ~~$(\hat{\mathbf{h}}^{(1)}_{JCE})$~~ and the filtered waveform signal ~~(y)~~ by a further single antenna interference cancellation ~~SAIC~~ detector ~~(20a)~~ of a second stage ~~(16)~~ of the single antenna interference cancellation ~~SAIC~~ receiver ~~(10)~~.

10. (Currently Amended) The method of claim 9, wherein the further desired bit decision signal ~~$(\hat{\mathbf{a}}(2))$~~ is an output signal of the single antenna interference cancellation ~~SAIC~~ receiver ~~(10) based~~ generated using ~~on~~ a predetermined criterion.

11. (Currently Amended) The method of claim 9, further comprising ~~the step of~~:

providing ~~(78)~~ the further desired bit decision signal ~~$(\hat{\mathbf{a}}(2))$~~ to a further joint channel estimator module ~~(24a)~~ of a third stage ~~(18)~~ of the single antenna interference cancellation ~~SAIC~~ receiver ~~(10)~~.

12. (Currently Amended) The method of claim 9, wherein the channel estimator ~~(22)~~ is an iterative constant modulus ~~(CM)~~ channel estimator and wherein the single antenna interference cancellation ~~SAIC~~ detector ~~(20)~~ and the further single antenna interference cancellation ~~SAIC~~

detector ~~(20a)~~ are constant modulus single antenna interference cancellation ~~(CM SAIC)~~ detectors.

13. (Currently Amended) A single antenna interference cancellation ~~(SAIC)~~ receiver ~~(10) for suppression of interfering co-channel signals, both synchronous or asynchronous, by calculating a desired impulse response estimate signal ($\hat{\mathbf{h}}_{JCE}^{(1)}$)~~, comprising:

a receiver filter ~~(12)~~ of the single antenna interference cancellation ~~SAIC~~ receiver ~~(10)~~, responsive to a radio signal ~~(11)~~, ~~for providing~~configured to provide a filtered waveform signal ~~($\mathbf{y}$)~~;

a means ~~(14) for providing~~ configured to provide a desired bit decision signal ~~($\hat{\mathbf{a}}(1)$)~~; and

a joint channel estimator ~~(24)~~ of the single antenna interference cancellation ~~SAIC~~ receiver ~~(10)~~, responsive to the filtered waveform signal ~~($\mathbf{y}$)~~, to the desired bit decision signal, ~~($\hat{\mathbf{a}}(1)$)~~ and to an interfering training sequence signal ~~(37)~~ and an interfering training sequence delay signal ~~(38)~~ generated without prior knowledge of training sequence of the interfering co-channel signal, ~~for providing~~configured to provide ~~the~~ a desired impulse response estimate signal ~~($\hat{\mathbf{h}}_{JCE}^{(1)}$)~~,

wherein said single antenna interference cancellation receiver is for suppression of interfering co-channel signals, both synchronous and asynchronous.

14. (Currently Amended) The single antenna interference cancellation ~~SAIC~~ receiver ~~(10)~~ of claim 13, wherein the

means for providing a desired bit decision signal ~~($\mathbf{\hat{a}}(1)$)~~ is a first stage ~~(14)~~ of the single antenna interference cancellation ~~SAIC~~ receiver ~~(10)~~, said first stage ~~(14)~~ comprises:

a channel estimator ~~(22)~~, responsive to the filtered waveform signal ~~(y)~~, ~~for providing~~ configured to provide an initial desired impulse response estimate signal ~~($\mathbf{\hat{h}}_{CM}$)~~; and

a single antenna interference cancellation ~~(SAIC)~~ detector ~~(20)~~, responsive to the initial desired impulse response estimate signal ~~($\mathbf{\hat{h}}_{CM}$)~~, configured to provide ~~for providing~~ the desired bit decision signal ~~($\mathbf{\hat{a}}(1)$)~~.

15. (Currently Amended) The single antenna interference cancellation ~~SAIC~~ receiver ~~(10)~~ of claim 13, wherein the channel estimator ~~(22)~~ is an iterative constant modulus ~~(CM)~~ channel estimator and single antenna interference cancellation ~~SAIC~~ detector ~~(20)~~ is a constant modulus single antenna interference cancellation ~~(CM-SAIC)~~ detector.

16. (Currently Amended) The single antenna interference cancellation ~~SAIC~~ receiver ~~(10)~~ of claim 13, further comprising at least one more stage ~~(16)~~, responsive to the desired bit decision signal ~~($\mathbf{\hat{a}}(1)$)~~ and to the filtered waveform signal ~~$\mathbf{y}$~~, configured to provide ~~for providing~~ a further desired bit decision signal ~~($\mathbf{\hat{a}}(2)$)~~.

17. (Currently Amended) The single antenna interference cancellation ~~SAIC~~ receiver ~~(10)~~ of claim 16, wherein the

further desired bit decision signal ~~($\hat{\mathbf{a}}(2)$)~~ is an output signal of a further single antenna interference cancellation ~~SAIC~~ detector ~~(20a) based on~~ generated using a predetermined criterion.

18. (Currently Amended) The single antenna interference cancellation ~~SAIC~~ receiver ~~(10)~~ of claim 16, wherein said at least one more stage that is a second stage ~~(16)~~ comprises:

a further single antenna interference cancellation ~~SAIC~~ detector ~~(20a)~~, responsive to the desired impulse response estimate signal ~~($\hat{\mathbf{h}}_{JCE}^{(1)}$)~~, configured to provide ~~for providing~~ the further desired bit decision signal ~~($\hat{\mathbf{a}}(2)$)~~; and

a joint channel estimator module ~~(24)~~, responsive to the desired bit decision signal ~~($\hat{\mathbf{a}}(1)$)~~ and to the filtered waveform signal ~~(y)~~, configured to provide ~~for providing~~ the desired impulse response estimate signal ~~($\hat{\mathbf{h}}_{JCE}^{(1)}$)~~.

19. (Currently Amended) The single antenna interference cacellation receiver ~~method~~ of claim 18, wherein the channel estimator ~~(22)~~ is an iterative constant modulus ~~(CM)~~ channel estimator and wherein the single antenna interference cancellation ~~SAIC~~ detector ~~(20)~~ and the further single antenna interference cancellation ~~SAIC~~ detector ~~(20a)~~ are constant modulus single antenna interference cancellation ~~(CM SAIC)~~ detectors.

20. (Currently Amended) The single antenna interference cancellation ~~SAIC~~ receiver ~~(10)~~ of claim 18, wherein said joint channel estimator module ~~(24)~~ comprises:

a replica signal generation means ~~(30)~~, responsive to the desired bit decision signal ~~($\hat{a}(l)$)~~, configured to provide ~~for providing~~ a replica signal ~~(32)~~ calculated ~~by said replica signal generation means (30)~~ as a convolution of the desired bit decision signal ~~$\hat{a}(l)$~~ and a replica impulse response ~~h_r~~ of said replica signal generation means ~~(30)~~;

an adder ~~(44)~~, for providing a residual signal $\hat{f}$ by subtracting the replica signal ~~(32)~~ from the filtered waveform signal ~~(y)~~;

a correlation means, responsive to the residual signal ~~($\hat{f}$)~~, configured to provide ~~for providing~~ the interfering training sequence ~~(37)~~ and its delay signal ~~(38)~~ identified by calculating correlating signals of said residual signal ~~($\hat{f}$)~~ with the candidate training sequences or training sequences convolved by a known transmission pulse shape for all possible bit positions; among said correlating signals, the maximum correlation signal is selected as the interfering training sequence signal ~~(37)~~ and the corresponding timing position as the interfering training sequence delay signal ~~(38)~~ which are provided to the joint channel estimator ~~(40)~~; and

a joint channel estimator ~~(40)~~, responsive to the filtered waveform signal ~~(y)~~, to the desired bit decision signal ~~$\hat{a}(l)$~~, to the interfering training sequence signal ~~(37)~~ and to the interfering training sequence delay signal

~~(38)~~, configured to provide ~~for providing~~ the desired impulse response estimate signal ~~($\hat{\mathbf{h}}^{(1)}_{JCE}$)~~.

21. (Currently Amended) The single antenna interference cancellation ~~SAIC~~ receiver ~~(10)~~ of claim 16, further comprising at least one further stage ~~(18)~~, responsive to the further desired bit decision signal ~~($\hat{\mathbf{a}}(2)$)~~ and to the filtered waveform signal ~~(y)~~, configured to provide ~~for providing~~ at least one further desired bit decision signal ~~($\hat{\mathbf{a}}(3)$)~~.